LOUISIANA OFFICE OF ENVIRONMENTAL ASSESSMENT
ENVIRONMENTAL TECHNOLOGY DIVISION
AIR QUALITY MODELING PROCEDURES

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INTRODUCTION

This document describes the current Louisiana Office of Environmental Assessment, Environmental Technology Division (ETD) modeling procedures. The ETD periodically changes its modeling procedures to reflect improvements in modeling theory or to correct modeling deficiencies that have been discovered. This document serves only as a guide to general modeling techniques and procedures required by the Office of Environmental Assessment, Environmental Technology Division (ETD). **Applicants should consult with the ETD before initiating modeling exercises to ensure that the latest procedures are followed.** The modeling procedures described here are designed to streamline modeling methods and to minimize the amount of computer time required, while preserving the quality of the modeling results used in each evaluation.

A written modeling protocol must be submitted to Office Environmental Assessment Environmental Technology Division for approval before executing any modeling.

ACCEPTABLE MODELS

The models and modeling procedures to be used for Prevention of Significant Deterioration (PSD) permits, state permits, Part 70 permits, variances, exemptions, and for ETD purposes will be those identified in the EPA "Guideline on Air Quality Models (Revised)", 1986.

Refined modeling must use **INDUSTRIAL SOURCE COMPLEX (ISC3) DISPERSION MODELS.** The Following models can be used: ISCPRIME, AERMOD and CALPUFF. Prior approval must be obtained from the ETD before using these models.

CONTROL PARAMETERS

The following control parameters are to be used in modeling:

- Urban III or Rural Dispersion Option

The selection should follow EPA's procedures for land use classification within a 3 kilometer (km) radius about the source. In certain cases where a large heat source is modeled in a rural area, such as an isolated petroleum refinery, it may be appropriate to use urban III dispersion coefficients instead of rural. The ETD should be consulted in such cases. The large heat source scenario cannot be applied to PSD applications.

- Regulatory Default Option

- Use stack-tip downwash (except for Schulman-Scire downwash);
- Use buoyancy-induced dispersion (except for Schulman-Scire downwash);
- Do not use gradual plume rise (except for building downwash);
- Use the calms processing routines;
- Use upper-bound concentration estimates for sources influenced by building downwash from super-squat buildings;
- Use default wind profile exponents; and
- Use default vertical potential temperature gradients.

METEOROLOGY

The ETD should be consulted as to what surface and upper air NWS station is most appropriate for a modeling exercise. The most recent, readily available 1 or 5 year meteorological data sets shall be used.

Meteorological Scenarios to be Used

The "Guideline on Air Quality Models (Revised)" (GAQM), (July, 1986) must be followed.

1. Meteorological Scenarios

A meteorological scenario is defined as a complete set of meteorological data for each hour of the time period being considered. This set will include the following for each hour:

Atmospheric stability class
Wind direction
Wind speed
Ambient temperature
Mixing height

2. Meteorological Scenarios for Determination of Greater Than De minimis Impact

All meteorological scenarios in the hourly sequential meteorological data set will be used to determine the area for which a source under review makes a greater than deminimis impact. For example, for the 1-hour CO NAAQS, the source under review will be modeled for each hour of each year.

3. Missing Meteorological Data

Minor gaps (4 consecutive hours or less) in surface data may be filled in by step-wise, linear interpolation. Minor gaps (1 missed upper air observation) in mixing height data may be filled by reasonable interpolation from the previous to succeeding day's data or by using a seasonal climatological average.

4. Anemometer Height

The input wind speed data are adjusted from the anemometer height to the release height for model calculations. For National Weather Service (NWS) data, the user should check records (e.g. the local Climatological Data summary report) for the particular station to determine the correct anemometer height for the data period used in the modeling, since the anemometer location and height may change over time. For the ON-SITE data, anemometer height should not be less than 10 meters for the data period used.

SOURCE INVENTORY

Air pollution sources other than the ones requested in the permit under review may need to be modeled. Parameters for sources that must be modeled are obtained from retrievals from the ETD.

1. Sources to be Permitted for 1 to 24 hour NAAQS Compliance

All sources to be permitted will be modeled at the maximum hourly emission rate requested in the permit application. All other source parameters must reflect source operations at this maximum allowable emission rate.

2. Sources to be Permitted for 3 Months to 1 Year NAAQS Compliance

All sources to be permitted must reflect maximum allowable (annual) emission rates. Background sources may reflect emission rates as described in Table 9-1 of the GAQM.

3. Sources for Prevention of Significant Deterioration (PSD) Increment Consumption

The sources to be modeled to determine PSD increment consumption are the sources being permitted and those identified by retrievals from the ETD. In some cases, neighboring source data from other states may be required. It is the responsibility of the applicant to obtain data from other states. Any suspicious data within the retrieval should brought to the attention of the modeling coordinator. Actual emission rates will be used for the sources identified by the retrieval modeling. The sources identified by the retrieval should be examined carefully. Recently permitted sources and proposed sources not found in the retrieval should be included. These proposed sources data can be found through the permit division file room. The sources to be permitted will be modeled at permit allowable emission rates.

4. Sources to be Modeled for Toxics Compliance

These sources are to be modeled at rates described in the Air Toxics Modeling Procedure beginning on page 8 of this document. The CAAA may require a different guideline depending on what compound is modeled, and the ETD should be consulted on this.

5. Variable Sources to be Permitted for 1 to 24 hour NAAQS Compliance

Some sources (e.g. utility boilers for power plants) will obviously not operate at 100% capacity at all times. The stack parameters (exit velocity and temperature) may reflect worse dispersion conditions than normal even though emission rates are lower. Thus, these sources may be required to model at 25%, 50% and 75% capacity.

RECEPTORS and RECEPTOR LOCATION

Receptors - theoretical locations arranged in Cartesian or polar coordinates around an emission source where concentrations are predicted to occur. The ETD prefers cartesian in all modeling analyses, polar grids are not acceptable for all modeling analyses. Please use Cartesian grids. For all time averages other than annual and 3-month, tables of highest and second highest concentrations are predicted by the model at all receptors. Receptors should be placed so that the maximum off-property ground-level concentration due to the concerned sources is determined.

1. Modeling for Applicant's Sources

Modeling should be performed using a cartesian receptor system, due to the possibility of background source modeling. Discrete receptors should be placed

at 100 meter intervals along the applicant's property line with additional receptors at 100 meter spacing from the property line to 1 kilometer away. Additional spacing will depend on whether the modeling is for NAAQS or toxics compliance. For NAAQS, the isopleth indicating significance must be nested in the receptor system. For toxics, the isopleth indicating the area of influence must be nested in the receptor system.

2. Modeling Background Sources

Receptors should initially be at a 1 kilometer course grid spacing. In the vicinity of areas where 75% of the NAAQS or TAPS standard is reached, 100 meter spacing should be used.

DESCRIPTION OF MODELING TO BE PERFORMED

The following are types of modeling that are performed for State Permits and Prevention of Significant Deterioration (PSD) permits.

1. NAAQS Review in Support of a State Permit, Part 70 permit
2. PSD Review
3. Air Toxics Modeling Procedure (FLOW CHART 1)

NAAQS REVIEW IN SUPPORT OF A STATE PERMIT

Usually, only the applicant's allowable emissions will be modeled for NAAQS compliance. Historically, PSD applicants have identified any SIP problems for any pollutant.

PSD PERMITS

Refer to the Example Air Quality Analysis Checklist, appendix C in EPA "Guidelines on Air Quality Models (Revised)", 1986 for further guidance.

PSD De Minimus

The first step in modeling for PSD applications is a screening determination of the impact of the contemporaneous net increases due to the proposed project. Refer to "Table A-5. Procedures for Determining the Net Emission Change at a source" of New Source Review Workshop Manual (Draft), October 1990, Page A-45.

Net Emission Change

EQUALS

*Emission **Increases** associated with the proposed modification*

MINUS

*Source-wide creditable contemporaneous emissions **Decreases***

PLUS

*Source-wide creditable contemporaneous emissions **increases***

The impact due to the contemporaneous net increase from the project must be modeled using ISC3 to determine if the increase results in a significant impact. The resulting concentrations predicted by the model are compared to the PSD significance level listed in Table 1. This is considered a screening run as

opposed to a refined model. If the screening run indicates the impact of these restricted inputs does not exceed the significance level at any off property receptor, no further modeling is required. If the screening run indicates a concentration at an offside receptor is above the significance level, additional modeling is required.(Refer to Pg. C.26 of the NSR Manual for further discussion of the impact area)

PSD Significance Limit

For a source of significant impact, refined modeling is required. First, determine the area of impact (AOI) of the source. This is a circular area around the source defined by a radius of length equal to the distance from the source to the farthest receptor showing a concentration greater than the significance limit. The refined modeling will predict concentrations to be compared to the NAAQS and allowable increment consumption levels.

Preconstruction Monitoring Exemption Levels

The next level of comparison is the preconstruction monitoring exemption level. If the applicant has a significant impact and a concentration above the preconstruction monitoring exemption level listed in Table 1, preconstruction monitoring may be required. If the applicant models above the exemption level but other sources (within the facility but not associated with the project and outside the facility but within the area of significant impact) modeled emissions are below the exemption level, preconstruction monitoring may not be required. Preconstruction monitoring may consist of monitoring data already available for the area. This data is used to determine existing background concentrations of the pollutant of concern. One year of data is required (sometimes 4
months is accepted to initiate a permit review) to be gathered prior to construction.

NAAQS Comparison

For comparison to the NAAQS, the applicant models allowable (permitted and/or grandfathered) emissions from major sources within the AOI(Area of Impact) + 50 kilometers and from all sources within the AOI. After doing a screen analysis the modeler may wish to use a refined model to reduce the area of significant impact. Using the receptors only within the AOI for this run.The concentrations predicted are added to background and compared to the NAAQS. If no concentration predicted by the model exceeds the NAAQS, the project is acceptable relative to this standard. If an exceedance is predicted, the receptor at which it occurs is examined. If the applicant is not significant at this receptor, the exceedance is not considered. If the applicant is significant at a receptor when modeling an exceedance for an annual or 3 month time period, no permit can be issued for the project. For standards having 1, 3, 8, or 24 hour averaging times (those other than annual and 3 months) where the applicant is significant at the receptor, the table of highest second highest values predicted by the model is compared to the NAAQS. If the highest 2nd highest is below the standard, the project is acceptable. If the highest 2nd highest is above the standard, the project is not allowed.

Increment Consumption

The next standard of comparison is the allowable increment consumption concentration. Increment consumption must be determined if the proposed sources make a significant impact for SO_2, PM_{10} or NO_x. The applicant obtains from the DEQ, EIS retrievals listing baseline emissions and current emissions. Modeling the baseline retrieval as negative emissions and the current as positive emissions will determine the increment consumed. The applicant may model actual emissions in this case (maximum proposed in the case of new or modified emission points). Alternatively an EIS retrieval from the baseline year is compared to the current retrieval. The value of current minus baseline (may be negative) is used as input for the model.

Facilities included in the retrieval are major sources of the pollutant of concern within the AOI + 50 km and all sources within the AOI. Mobile and area sources must be considered for NOx (Contact LDEQ Air Quality for mobile and area source for information). Predicted concentrations are compared to the allowable increment consumption. If the increment is not completely consumed, the project is acceptable relative to this standard. If the increment is consumed at a particular receptor, the project must be significant at that receptor in order to be disallowed. The table of highest second highest values is used as described above to evaluate the project.

AIR TOXICANT MODELING PROCEDURE

The impact of all pollutants having potential for adverse health effects is reviewed by the ETD.

Screening for Toxicants with Standards in LAC 33:III.51.Table 51.2

Those pollutants with chronic (e.g. carcinogenic) effects, such as benzene, for which a unit risk estimate and annual standard have been established, shall be modeled with the most recent appropriate one year meteorological data set and the current version of the ISCST3 model. Note that all requested permitted average annual facility emissions for a pollutant that has not previously been modeled for risk assessment shall be modeled if a determination for such modeling has been made at the discretion of the Louisiana Air Quality Regulatory Division. The regulatory options of the ISCST3 model must be set.

1. If modeled results are less than 0.075 of the Table 51.2 standard at all off property receptors, then no further analysis is necessary.

2. If modeled results are greater than or equal to 0.075 of the Table 51.2 standard at any off property receptor, the analysis set forth in **item 2 Area of inclusion** shall be applied. The value of 0.075 of the Table 51.2 standard defines an area of inclusion as explained below.

3. If the impact is greater than 7.5%, but less than 75%, of the Table 51.2 standard, the refined model should include 1 year of meteorological data, other sources of the pollutant of concern within the AOI, and actual average emissions from other sources. Results should be mapped as achieving 75% and 100% of standard, if applicable.

   If 75% of the Table 51.2 standard is exceeded at any off property receptor, then four additional consecutive years of preprocessed meteorological data shall be used.

4. If, when employing this five years of data, every off property receptor is attributed a concentration less than the Table 51.2 standard, no further analysis is necessary.

5. If the Table 51.2 standard is exceeded at one or more off property receptors, then a USGS map shall be provided with isopleths demonstrating receptors at 75% and 100% of the standard.

Those pollutants with acute effects (excluding those also having chronic effects not listed in Table 51.2) shall be modeled for an 8 hour averaging time for compliance with the value listed in LAC 33:III.51.Table 51.2. The current version of the ISCST3 model shall be used with one year of the appropriate preprocessed meteorological data. Note that all permitted average annual facility emissions for a pollutant that has not previously been modeled for acute effects assessment shall be modeled if a determination for such modeling has been made at the discretion of the Louisiana Air Quality Regulatory Division. The regulatory options of the ISCST3 model must be set.

1. If modeled results are less than 0.075 of the Table 51.2 standard at all off property receptors, then no further analysis is necessary.

2. If modeled results are greater than or equal to 0.075 of the Table 51.2 standard at any off property receptor, the analysis set forth in **item 2 Area of inclusion** shall be applied. The value of 0.075 of the Table 51.2 standard defines an area of inclusion as explained below.

3. If the impact is greater than 7.5%, but less than 75%, of the Table 51.2 standard, the refined model should include 1 year of meteorological data, other sources of the pollutant of concern within the AOI, and actual average emissions from other sources. Results should be mapped as achieving 75% and 100% of standard, if applicable.

   If 75% of the Table 51.2 standard is exceeded at any off property receptor, then four additional consecutive years of preprocessed meteorological data shall be used.

4. If, when employing this five years of data, every off property receptor is attributed a concentration less than the Table 51.2 standard, no further analysis is necessary.

5. If the Table 51.2 standard is exceeded at one or more off property receptors, then a USGS map shall be provided with isopleths demonstrating receptors at 75% and 100% of the standard.

Screening for Chronic Toxicants without Standards

Those pollutants with chronic (e.g. carcinogenic) effects for which a unit risk estimate, but no ambient air standard, has been established, shall be modeled with an appropriate five year rammet data deck and the current version of the ISCST3 model . Note that all requested permitted average annual facility emissions for a pollutant that has not previously been modeled for risk assessment shall be modeled if a determination for such modeling has been made at the discretion of the Louisiana Air Quality Regulatory Division. The regulatory options of the ISCST3 model must be set.

1. If multiplication of every off property receptor concentration by the unit risk factor results in a value of less than $5x10^{-7}$, no further analysis is necessary.

2. If multiplication of any off property receptor concentration by the unit risk factor results in a value of $5x10^{-7}$ or greater, the analysis set forth in **item 2 Area of inclusion** shall be applied. The value of $5x10^{-7}$ defines an area of inclusion.

3. If one or more off property receptors results in a value of greater than $1x10^{-6}$, isopleth for 10^{-6}, 10^{-5} and 10^{-4} value shall be provided on a United States Geological Survey (USGS) quad map.

Screening for Acute Toxicants without Standards

Those pollutants with acute effects shall be modeled for 8 hour averaging time. The current version of the ISCST3 model shall be used with one year of the appropriate preprocessed meteorological data. Note that all permitted average annual facility emissions for a pollutant that has not previously been modeled for acute effects assessment shall be modeled if a determination for such modeling has been made at the discretion of the Louisiana Air Quality Regulatory Division. The regulatory options of the ISCST3 model must be set.

1. If modeled results are less than 0.075 of 1/42 TLV at all off property receptors, then no further analysis is necessary.

2. If modeled results are greater than or equal to 0.075 of 1/42 TLV at any off property receptor, the analysis set forth in **item 2 Area of inclusion** shall be applied. The value of 0.075 of 1/42 TLV defines an area of inclusion.

3. If the impact is greater than 7.5%, but less than 75%, of 1/42 of the TLV, the refined model should include 1 year of meteorological data, other sources of the pollutant of concern with in the AOI, and actual average emission from other sources. Results should be mapped as achieving 1/42 of TLV.

   If 75% of 1/42 TLV is exceeded at any off property receptor, then four additional consecutive years of preprocessed meteorological data shall be used.

4. If, when employing these five years of data, every off property receptor is attributed a concentration less than 1/42 of the TLV, no further analysis is necessary.

5. If 1/42 of the TLV is exceeded at one or more off property receptors, then a USGS map shall be provided with isopleths demonstrating the areas exceeding 1/42 of the TLV.

Area of inclusion

1. An area of inclusion (AOI) shall be defined as a circle whose radius is determined as that maximum (not to exceed 50 Km) distance from the applicant's facility where modeled receptors exceed 0.075 of the standard.

2. Other sources within the area of inclusion emitting identical pollutants must be modeled using actual average annual emission rates along with the average annual requested allowable emissions from the applicant's facility. Where appropriate, mobile and other background sources may also be required to be included in this multisource modeling. Receptors are only required for points within the AOI.

GUIDANCE FOR MODELING SPECIFIC TYPES OF SOURCES

The "Guideline on Air Quality Models (Revised)", 1986 must be followed.

1. Fugitive Sources

Fugitive sources will not be modeled unless the emission rates can be quantified. All area sources and quantified fugitive sources are modeled as pseudo point sources. One or several point sources can be designated to simulate an area source. Release height of the fugitive source is used as the point source stack height. Ground level sources should be modeled at 1.01 meters. Stack exit velocity should be 0.001 m/s. Stack diameter should be 1 meter. Stack temperature should be 0^{o}K, which causes the model to use the ambient temperature if above 0^{o}K in the ISCST3 model. The ISCST3 model should use an average ambient temperature appropriate to the geographical region. The new ISC3 model adequately handles the modeling of area and volume sources. This modeling method can be applyied to model fugitive source.

a. Screening Analysis

Wind blown emissions from storage piles are not included in the modeling for a screening analysis. Wind blown emissions from storage piles depend upon the wind speed, and the emission rate is normally calculated based upon an average wind speed. This emission rate will greatly overpredict the wind blown emissions that occur at low wind speeds. If the average wind blown emissions

are included in a screening analysis, they will have a major influence upon the determination of the worst-case meteorology. However, if the same situation has been modeled with emission rates based upon low wind speeds, the effect of the wind blown emissions would be minimal, and a different set of worst-case conditions would be identified. The most practical approach is to exclude the wind blown emissions from storage piles in the screening analysis.

b. Refined Analysis

When a predicted concentration from screening runs exceeds 75% of the standard or guideline of concern, a refined analysis should be performed for all such time periods. For each time period to be modeled, the average wind speed for each hour to be modeled should be used to recalculate all emission rates that are a function of wind speed.

2. Flares

Flares are a special type of source, but are modeled as a point source. Use the following steps for deriving the stack parameters for modeling a flare:

STEP 1:Calculate the total heat release (H) of the flared gas based on the gas heat content and the gas consumption rate.

STEP 2:Assume that 45% of H is released as sensible heat (Q_H)

Q_H(cal/sec) = 0.45 x H(cal/sec)

STEP 3:Calculate the effective stack diameter using the following formula

d_s (m) = 9.88×10^{-4} x $[Q_H]^{1/2}$

STEP 4:Final stack parameters for model input are as follows

h_g = height of flare stack
d_g = (calculated in STEP 3)
v_g = 20 m/sec
T_g = 1273 ^{o}K

3. Roads

Determining an emission rate for dust generated by traffic on roads is difficult. Calculations to determine these emission rates have a number of variables, most of which are not readily determined accurately. In addition, the values for these variables can vary over a wide range and in many cases depend upon recent meteorological events. AP42, EPA's document on calculating emission rates, indicates that unless site-specific information is used, there is a low confidence level that can be placed upon these short-term emission rates. Because of this, the ETD does not require that short-term emissions from roads be evaluated with modeling. However, AP42 assigns the highest confidence level available to annual emission rates from traffic on roads. Accordingly, the ETD requires that road emissions be modeled on an annual basis. The road emissions should be divided into a number of point sources. The ETD should be consulted for assistance in determining the placement of the point sources and the height to use for modeling. These will be determined on a case-by-case basis, but will generally follow the guidance given in the users' guide to the ISC3 model.

4. Special Vents and Other Release Points

There are a number of sources that must be modeled but that do not release to the atmosphere through standard stacks. Examples are stacks or vents with rain caps, and stacks or vents with horizontal releases. These release points must be modeled as if they are stacks, so the stack parameters used must cause the model to correctly simulate the way the release is dispersed in the atmosphere.

Release points that have rain caps or that do not release vertically must be modeled with a stack velocity of 0.001 m/s, a stack diameter of 1 meter, and actual stack temperature. The ETD must approve the use of nonstandard parameters that are to be used in the models. The new ISC3 model adequately handles the modeling of area and volume sources. This modeling method can be apply to model fugitive source.

5. Other Approval Modeling Procedures

The following modeling procedures are not included in EPA "Guideline on Air Quality Models (Revised)" document EPA-450/2-78-027R date July, 1986. If the procedures listed below are to be used, approval from the ETD must be obtained.

- 20 D rules
- Merging Parameters for Multiple Stacks
- Air Toxics ranking
- Richard D. Scheffe Method
- Ambient Ratio Method (ARM) and Ozone Limiting Method

Building Downwash And GEP

The effects of building wakes upon stack plumes is evaluated for state permits using both the Huber-Snyder and Schulman-Scire algorithms. The ISC3 users guide, as well as EPA's Good Engineering Practice (GEP) stack height guideline document should be consulted for details. For federal permits, the "Guideline on Air Quality Models (Revised)" must be followed. For each stack, the GEP height should not be greater than 65 meters unless the ETD agrees with the company's interpretation of these guidelines. Please provide photographs of the building (or buildings) which influences the stack height calculations as well as drawings indicating the building locations and heights.

REPORTING REQUIREMENTS

Modeling analysis submitted to the ETD must be accompanied by a clear, concise written discussion covering the project, the modeling performed, and the results relative to applicable standards or guidelines. The submitted report must contain at least the elements listed below. In some instances, additional information may be required.

1. Overview of the Project

Include a general discussion of the plant processes and the types of locations of emission sources under consideration.

2. List of Emissions and Stack Parameters

Emission Point Identification, Stack Height, Stack Diameter, Velocity, should be listed in mgs units.

3. Plot Plan

The plot plan should include a clearly marked scale, property lines, emission points, a true north arrow, reference UTM's or latitude and longitude. Buildings with dimensions shown, with the building height indicated.

4. Models Utilized

A list of the models utilized should be presented, including notation of model options and inputs (e.g., met data and period of record, rural or urban option, type of plume rise, etc.). Include a discussion of how the modeling analysis

was performed. If a nonstandard method or approach was used, this should be explained in detail, and the technical basis for the method or approach should be included. Such an approach should not be used without receiving prior approval from the ETD.

5. Receptors

Include a discussion of receptor design considerations, with special emphasis upon the selection of property line receptors. A diagram of the receptors (grids) and their nomenclature should be included.

6. Building Wake Effects

This discussion should include an explanation describing how the downwash structures were selected for each source.

7. Flares

If a flare has been modeled, include the data used to develop the stack parameters for the modeling and show all calculations related to the development of these parameters.

8. Summary of Modeling Results

A summary and discussion of the modeling results relative to all applicable standards or guidelines must be presented. If several standards or guidelines are addressed, tabulated results are preferred. If a technique is used to ratio predicted concentrations to determine final concentrations, discuss how this method has been applied and supply sample calculations.

9. Modeling Runs

All pages of input and output printed by the model must be included for all applicable modeling runs. Where appropriate, array maps of both calibrated and uncalibrated concentrations should be included. Applicants are encouraged to denote property lines on each array map. Modeling runs may be submitted on diskette if the ETD approves.
Copy of input files diskettes for 10 or more emission points must be submitted with the modeling report (3.5 inches or 5.25 inches diskette).

The content of the applicant's modeling submittal and the adherence to ETD modeling guidances will form the basis for acceptance of the modeling performed.

TABLE 1

NATIONAL AMBIENT AIR QUALITY STANDARDS(NAAQS),PSD INCREMENT SIGNIFICANT EMISSION, MODELING SIGNIFICANCE LEVELS,AND MONITORING DE MINIMIS CONCENTRATIONS

POLLUTANT	AVERAGING PERIOD	NAAQS ($\mu g/m^3$) PRIMARY	NAAQS ($\mu g/m^3$) SECONDARY	PSD INCREMENTS ($\mu g/m^3$) CLASS I	PSD INCREMENTS ($\mu g/m^3$) CLASS II	PSD INCREMENTS ($\mu g/m^3$) CLASS III	SIGNIFICANT EMISSION RATES (TON/YEAR)	MODELING SIGNIFICANCE LEVEL ($\mu g/m^3$)	MONITORING DE MINIMIS CONCENTRATIONS ($\mu g/m^3$)
PM-10 Particulate Mater	Annual	50	Same as Primary	5	17	34	15 or 25 (TSP)	1	-
	24-hour	150[a]	Same as Primary	10	30	60		5	10
SO_2	Annual	80	-	2	20	40	40	1	-
	24-hour	365[a]	-	5[a]	91[a]	182[a]		5	13
	3-hour		1300[a]	29[a]	512[a]	700[a]		25	-
NO_x	Annual	100	Same as Primary	25	25	50	40	1	14
Ozone	1-hour	235(0.12ppm)	Same as Primary	-	-	-	40[b]	-	14
CO	8-hour	10,000[a](9ppm)	Same as Primary	-	-	-	100	500	575
	1-hour	40,000[a](35ppm)	Same as Primary	-	-	-		2,000	
Lead	Calendar Quarter	1.5	Same as Primary	-	-	-	0.6	-	0.1[d]
Fluorides	24-hour	-	-	-	-	-	3.0	-	0.25
H_2SO_4 mist	-	-	-	-	-	-	7	-	-
TRS(H_2S)	1-hour	-	-	-	-	-	10	-	0.2
CFC'S 11,12,112,114,115		-	-	-	-	-	1	-	-
HALONS 1211,1301,2402		-	-	-	-	-	1	-	-
Acid Gas (MWC)		-	-	-	-	-	1	-	-
Metals & Organics (MWC)		-	-	-	-	-	1	-	-

[a]Concentration not to be exceeded more than once per year
[b]Emission of volatile organic compounds.
[c]Increase in volatile organic compounds of greater than 100 tons/year.
[d]Twenty-four-hour-average.